

Math + Hispanic Art = ♥

Project Overview: You'll work in groups of 2-4 students to examine artwork or architecture for parent graphs (for Spanish students, specifically Hispanic art). Using what you learn in class, you'll create the equation, table, and full analysis of the graphs in the artwork to help you dissect the painting. For Spanish, you'll also look at Hispanic artists, their time period, when/where they were born, significant events from that time period, and analyze paintings from that artist.

Driving Question: How can math be used as a lens to examine the effect of time periods on Hispanic art?

By the end of this project, I will understand how to...

Trigonometry Essential #4: Transform parent graphs to model real-world situations.

- Transform a graph by stretching, compressions, shifting, and flipping
- Write a general equations for a family of functions
- Model physical situations with quadratic functions

Spanish Essential #1, 5 & 7:

- I can craft a 350-word essay in Spanish using proper punctuation and format.
- I am able to comprehend Spanish in a predictable context.
- I can combine sentences to formulate a paragraph.

Deliverable: With your group, you'll create an art gallery exhibit/display that fully analyzes the painting and if you are in Spanish, the artist and his/her time period. **All 5 parent graphs must appear in the art** you choose.

Check ☑	Due Date		Description
	Thurs, Jan 19 Fri, Jan 20		Checkpoint #1: -Spanish elements (see Sra. Hernandez's project guide) -Trigonometry elements (see questions below)
	Fri, Jan 27		Checkpoint #2: -Spanish elements (see Sra. Hernandez's project guide) -Trigonometry elements (see questions below)
	First Draft: Fri, Feb 3	Final Draft: Fri, Feb 10	Final Deliverable can be in any form you like, as long as they answer all specific questions from Spanish (if you are in this class) and Trigonometry.
	Practice: Weds, Feb 8 Thurs, Feb 9	Actual: Fri, Feb 10	Presentation will be in an art gallery format, with members of our school and community in attendance.

Trigonometry Components:

****Each group's project can use as many paintings as desired, but ALL FIVE functions we've discussed in class MUST be identified and analyzed!**

For ALL FIVE functions:

Checkpoint #1 Items

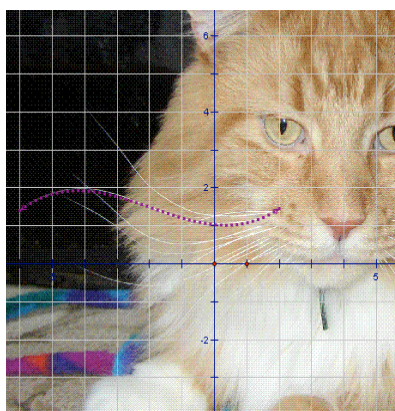
1. Find an example of the graph of a function in a work of art or architecture. If you are in Spanish, you must choose a piece of Hispanic art as discussed in Sra. Hernandez's class. If you do not have Spanish, you are free to choose what you like, as long as it is appropriate.
 - a. **IF YOU WANT THE ART PRINTED IN COLOR... you must email it to me by lunchtime – it will be ready by the next day at lunch. No exceptions or last minute requests for color-printing.**
2. Draw a coordinate graph system over the picture of the work of art or architecture that you've chosen (you may need to enlarge the functional part of the artwork to draw a set of coordinate axes. If so, please include a copy of the original work of art or architecture as well). Mark the scale clearly.
3. State the domain & range of the equation *as shown in the artwork*.
4. Find the coordinates of three points on your graph.

Checkpoint #2 Items:

5. Use these three points to find the equation of each function. Show the work for finding the equations.
6. Find the coordinates of another point on each graph and check to make sure your model works for that point by substituting into your equation. Show this work too.
7. Create a table for each graph.
8. Identify any other key points, x & y-intercepts, or asymptotes.
9. Describe the significance of the point (h,k) for each family of functions as well as for your artwork.

Finishing up for the final deliverable:

10. Cite your sources on a separate Works Cited sheet in MLA format - refer to Owl Purdue at <http://owl.english.purdue.edu/owl/resource/747/09/>
11. Present your results in a well-written book or neat, well organized poster. You can also write a story utilizing the artwork, as long as you incorporate all important elements above.



Honors Option:

Design your own piece of artwork that incorporates all five functions prominently in the design. All aspects of the graph must be identified (see instructions above) including the equation, domain, range, etc. If you are in Spanish, you should do this using the original artwork you create for Sra. Hernandez's class.

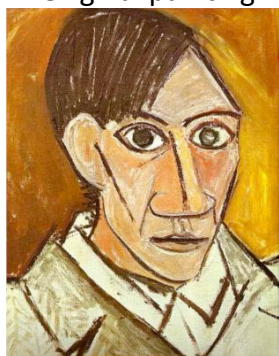
Project Calendar

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
PROJECT WEEK ONE				
9 Entry Event (Spanish)	10 Entry Event (Spanish)	11 Select groups in Trig Entry Event (Trig) with pictures of parent graphs Start choosing paintings or art to work with	12 Select groups in Trig Entry Event (Trig) with pictures of parent graphs Start choosing paintings or art to work with	13 Introduce project
PROJECT WEEK TWO				
16 MLK Day	17	18	19 Checkpoint 1	20 Checkpoint 1
PROJECT WEEK THREE				
23	24	25	26	27 Checkpoint 2
PROJECT WEEK FOUR				
30	31	1	2 Rough draft of deliverable	3 Rough draft of deliverable
PROJECT WEEK FIVE				
6	7	8 Practice presentation Peer & self evaluation	9 Practice presentation Peer & self evaluation	10 Final deliverable due

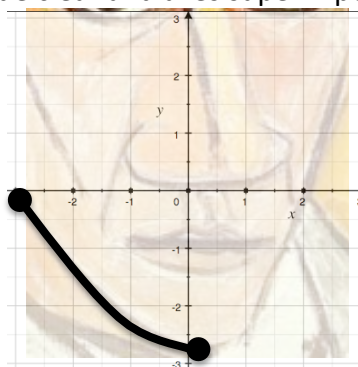
Sample Layout (should have one of these for ALL FIVE types of functions)

Exponential family of functions

Original painting



→ Graph made clear and axes superimposed



3.

Domain: $[-3, 0.25]$ ← Note that the domain is only for the portion of the painting that the graph is in!!

Range: $[-2.8, 0]$

4. Three points: $(-3, 0)$ $(-2, -1.5)$ $(0, -2.75)$

5. Work demonstrating I can find the equation of this line

Equation: $y = \dots$

6. Checking $(-0.5, -2.5)$ in equation to make sure it is accurate:

7. Table

x	y

8. x-intercepts: $(-3, 0)$

y-intercepts: $(0, -2.75)$

Asymptote: $y = -2.8$

9. (h, k) in my graph is the point $(-1, 2.5)$, shifted from its usual spot $(1, 0)$. For the painting, this is the point near the base of Pablo Picasso's chin. This part of the painting is important to Picasso's art because...

10. Don't forget one overall Works Cited page to cite all artwork used, the painter, etc.

Group Master Action Plan

Describe project in your own words:

Academic goal of project:

I agree to work as a collaborative member of my group, trying hard to the best of my ability. I will not let my group down.

Signed: _____

Function family	Check - point	Description	Assigned to...			
			Name:	Name:	Name:	Name:
Quadratic	#1	Painting with function identified, graph paper drawn on top of painting				
	#1	Domain, range, key points, asymptotes, etc. identified				
	#2	Three points used to find equation of function in painting; another point used to test equation.				
	#2	Table & key points, asymptotes, etc. identified				
	#2	(h,k) discussed				
Cubic	#1	Painting with function identified, graph paper drawn on top of painting				
	#1	Domain, range, key points, asymptotes, etc. identified				
	#2	Three points used to find equation of function in painting; another point used to test equation.				
	#2	Table & key points, asymptotes, etc. identified				
	#2	(h,k) discussed				
Reciprocal	#1	Painting with function identified, graph paper drawn on top of painting				
	#1	Domain, range, key points, asymptotes, etc. identified				
	#2	Three points used to find equation of function in painting; another point used to test equation.				
	#2	Table & key points, asymptotes, etc. identified				
	#2	(h,k) discussed				

Square root	#1	Painting with function identified, graph paper drawn on top of painting				
	#1	Domain, range, key points, asymptotes, etc. identified				
	#2	Three points used to find equation of function in painting; another point used to test equation.				
	#2	Table & key points, asymptotes, etc. identified				
	#2	(h,k) discussed				
Exponential	#1	Painting with function identified, graph paper drawn on top of painting				
	#1	Domain, range, key points, asymptotes, etc. identified				
	#2	Three points used to find equation of function in painting; another point used to test equation.				
	#2	Table & key points, asymptotes, etc. identified				
	#2	(h,k) discussed				
ALL	Rough draft	Works Cited page for all paintings				